5. Answer the following questions (any *three*) : 5 × 3

(*a*) Define criteria for essentiality. Classify essential elements for plant nutrition. Explain the functions, deficiency and toxicity symptoms of any 3 of them in plants.

(*b*) Trace the path of carbon in C_3 plants. How does it differ from C_4 plants ? Briefly explain the overview of C_3, C_4, CAM pathways.

(*c*) Explain in details the different factors affecting photosynthesis and mention the discovery of them.

(*d*) Give an account of physiological role of Ethylene. Write the commercial applications of Ethylene for a new farming Innovation.

(*e*) What is auxin bio-assay ? Diagrammatic neat and clean presentation of Auxin Bio-Synthesis (all the three Pathways).

B.Sc.(Ag)—IIS (CP-121)

2019

(2nd Semester)

Time : 2 hours

Full Marks : 50

Answer **all** questions

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(FUNDAMENTAL OF CROP PHYSIOLOGY)

1. Fill in the blanks : 1 × 10

(*i*) CO_2 compensation point for C_3 cycle is _____ ppm whereas for C_4 cycle it is _____ ppm.

(*ii*) Active absorption occurs due to the _____ activity and passive absorption occurs due to the activity of _____ .

(*iii*) For the synthesis of 1 mole of glucose, no. of moles of ATP used by C_3 plants is _____ and by C_4 plants is _____ .

(*iv*) Auxin synthesis takes place in the presence of _____ and _____ .

(*v*) High concentration _____ and _____ induces shoot differentiation in tobacco callus.

(*vi*) Lenticular transpiration contributes _____% and stomatal transpiration _____% of total transpiration.

(*vii*) Water potential is the sum of _____ and _____ .

(*viii*) Osmosis refers to the flow of solvents from _____ concentration to _____ concentration.

(*ix*) Deficiency of _____ and _____ elements slows down stomatal movement.

(*x*) _____ is an association of fungi with plant roots which helps in the _____ of nutrients in soil.

2. **Multiple choice questions :** 1 × 10

(*i*) Peroxisome is associated with

(*a*) Photorespiration

(*b*) Dark respiration

(*c*) Glyoxylate cycle

(*d*) Pentose phosphate pathway

(*ii*) Thylakoids are not stacked in grannum of

(*a*) Algae

(*b*) Bryophytes

(*c*) Angiosperms

(*d*) Conifers

(*iii*) Polar transport of hormones is attributed to –

(*a*) Auxins

(*b*) GA

(*c*) Cytokinin

(*d*) Ethylene

(*iv*) Partenocarpic fruits are produced by spraying –

(*a*) Auxin on flowers

(*b*) Ethylene on flowers

(*c*) Abscisic acid on flowers

(*d*) AMO-1618 on flowers

(*v*) Which of the following is synthesised in the laboratory –

(*a*) Auxin a

(*b*) Auxin b

(*c*) Heteroauxin

(*d*) All the above

(*vi*) The no. of gibberellins known today is –

(*a*) 60

(*b*) 72

(*c*) 50

(*d*) 80

(*vii*) The metal involved in stomatal movement is –

(*a*) Zn^{2+}

(*b*) Mg^{2+}

(*c*) K^{+}

(*d*) Mn^{+}

(*viii*) Active K^{+} theory for stomatal movement was proposed by

(*a*) Levitt

(*b*) Scarth

(*c*) Yin and Tung

(*d*) Steward

(*ix*) Water potential is highest in –

(*a*) Atmosphere

(*b*) Soil

(*c*) Leaves

(*d*) Root

(x) Which of the following is responsible for passive absorption of water in tall plants.

(a) Root activity

(b) Root pressure

(c) Transpiration pull

(d) Diffusion

3. Write True or False : $\frac{1}{2} \times 10$

(a) Cell membranes are permeable to protein and impermeable to salts and gases.

(b) Water absorption is maximum at 30-40° celcius.

(c) Phenolic acid is a natural antitranspirant.

(d) DCMU (a herbicide) inhibits PSI and photolysis of water.

(e) C_4 plants are adapted to hot and humid climate.

(f) Barley endosperm test is a bioassay technique for cytokinin.

(g) GA_3 induces genetically female flowers to produce male flowers.

(h) In CAM plants stomata opens during the day and closes at night.

(i) Deficiency symptoms for potassium first appear on young leaves.

(j) Water potential is lowest in the atmosphere.

4. Write short notes on (any *five*) : 2 × 5

(a) Structural elements

(b) Ascent of Sap

(c) Efficiency of CAM plants

(d) CO_2 Compensation point

(e) Allelopathic compounds

(f) Differentiation

(g) Effect of air pollutants on photosynthesis.